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Science and Technology for Tomorrow's Air and Space Force

Success Story

HIGH-TEMPERATURE MATERIALS RESEARCH TEAM RECEIVES STAR TEAM AWARD FOR OUTSTANDING CONTRIBUTIONS

The selection of Dr. Dennis M. Dimiduk's High-Temperature Materials Research Team for an Air Force Office of Scientific Research (AFOSR) Star Team Award recognizes group and individual achievement and highlights the contributions of the Materials and Manufacturing Directorate. The team's selection exemplifies the technical expertise, professionalism, and dedication of the men and women in the directorate and also enhances the directorate's key role as the last remaining domestic center of excellence investing in the development of titanium aluminide (TiAl) base alloys.

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Accomplishment

AFOSR recently presented a Star Team Award to Dr. Dimiduk and his team for outstanding contributions to the Air Force and Department of Defense (DoD) including 19 published, accepted, or submitted journal articles; 3 invention disclosures and patents; 7 conference proceedings; and 12 invited talks in 2002. The award recognizes teams of researchers and leaders who demonstrate world-class excellence in their chosen areas of research. The combined effort clearly impacts the high-temperature materials science and engineering community at large and directly supports several immediate objectives of the Air Force and DoD.

Background

Dr. Dimiduk is an internationally recognized scientist and leader in advanced metals and intermetallic alloys. His contributions include pioneering research that enabled the successful development of a revolutionary class of advanced gamma TiAl for Air Force applications; patenting an ultra-high-strength, fully-lamellar gamma alloy that served as an enabling technology for rotors in the Integrated High Performance Turbine Engine Technology Phase III program; and patenting intermetallic alloys for first-stage turbine airfoils in support of the Versatile Affordable Advanced Turbine Engine studies.

The High-Temperature Materials Research Team played a critically important role in defining the mechanisms controlling the processing-structure-property relationships in gamma TiAl alloys. Their effort focused on developing an understanding and control of nanometer-scale microstructural effects on strengthening and development of advanced high-temperature materials with a unique balance of strength, high-temperature creep resistance, and fracture properties.

This research helps with the design of advanced fracture-critical engine components from these lightweight, revolutionary materials. Continuing research using these new materials could lead to revolutionary levels of turbine engine performance, attainable through expanded utilization of the outstanding properties in rotors, low-pressure turbine blades, and engine casings.

Dr. Dimiduk's team has a profound influence on the design concepts and development of advanced aerospace systems, hypersonic vehicles, and advanced aircraft engines. He has received several high-level awards for his outstanding accomplishments including the 1991 Alan T. Waterman Award for Science.

AFOSR has named Dr. Dimiduk a Star Team Leader twice before. He is a recipient of the Outstanding Engineers and Scientists Award presented annually by the Affiliate Societies Council of Dayton, Ohio.

Additional information

To receive more information about this or other activities in the Air Force Research Laboratory, contact TECH CONNECT, AFRL/XPTC, (800) 203-6451 and you will be directed to the appropriate laboratory expert. (03-ML-21)